

Appln. No.: 10/005,656
Amendment dated January 9, 2004
Reply to Office Action of October 9, 2003

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A process for fabricating green fibrous monolith composite composites materials comprising:

combining a first powder with a thermoplastic polymer binder to create a uniformly suspended first composition,

combining a second powder with a thermoplastic polymer binder to create a uniformly suspended second composition,

forming the first and second uniformly suspended compositions to create a feed rod having a first portion of the first composition surrounded by a second portion of the second composition; and

extruding the feed rod through a deposition nozzle onto a surface in a directed orientation by mechanically manipulating at least one of the deposition nozzle and surface to form [[a]] green fibrous monolith composite materials.

2. (Original) The process of Claim 1 wherein the first and second powders are selected from the group consisting of metal, metal alloy, carbide, nitride, boride, oxide, phosphate and silicide.

3. (Previously Presented) The process of claim 1 wherein the volume fraction of the first portion is between about 50 to about 99% and wherein the volume fraction of the second portion is between about 1 to about 50%.

Appln. No.: 10/005,656

Amendment dated January 9, 2004

Reply to Office Action of October 9, 2003

4. (Previously Presented) The process of claim 3 wherein the volume fraction of the first portion is between about 80 to about 95% and wherein the volume fraction of the second portion is between about 5 to about 20%.
5. (Currently amended) The process of claim 1 wherein the green fibrous monolith composite materials are ~~[[is]]~~ formed of a continuous fibrous monolith feed rod.
6. (Previously Presented) The process of claim 1 wherein the deposition nozzle includes an extrusion head and the feed rod is extruded through the extrusion head at a pressure effective for passing the feed rod through the extrusion head.
7. (Currently amended) The process of claim 1 wherein in the green fibrous monolith composite materials the second portion forms a separation matrix for maintaining the first portion as one or more discrete portions.
8. (Previously Presented) The process of claim 1 wherein the particle size distribution of the first and second powders is between about 0.01 to about 100 microns.
9. (Previously Presented) The process of claim 8 wherein the particle size distribution of the first and second powders is between about 1 to about 10 microns.
10. (Previously Presented) The process of claim 1 wherein deposition of the extruded feed rod occurs in layers onto the surface.
11. (Currently amended) The process of claim 1 wherein a computer modeling program assists with manipulating the deposition nozzle and surface in forming the green fibrous monolith composite materials from the extruded feed rod.
12. (Previously Presented) The process of claim 1 wherein the extruded feed rod is deposited with its axis generally parallel to the surface.

Appl. No.: 10/005,656
Amendment dated January 9, 2004
Reply to Office Action of October 9, 2003

13. (Currently amended) A process for mechanically forming a green fibrous monolith composite body comprising:

providing a first formable composition including a ceramic or metallic particulate material and a thermoplastic polymer binder;

providing a second formable composition including ceramic or metallic particulate material and a thermoplastic polymer binder, the second composition different from the first composition;

passing the first and second compositions to a mechanically-controlled movable assembly for forming and extruding a green filament and guiding the extruded green filament onto an associated surface, wherein the extruded green filament includes a central portion of the first composition surrounded an outer portion of the second composition; and

depositing the extruded green filament in one or more layers onto the associated surface, the one or more layers each having a predetermined filament orientation, to form a green fibrous monolith composite body, wherein the composite body includes one or more discrete portions of the first composition within an essentially continuous matrix of the second composition.

14. (Previously Presented) The process of claim 13 including providing a third composition different from at least the first or the second composition and passing the third composition through the deposition assembly with the first and second compositions, wherein the green filament includes an outer surrounding portion of the third composition.

15. (Previously Presented) The process of claim 13 wherein two or more of the extruded green filaments are bundled and passed through the extrusion head to form a multifilament extruded fiber and wherein the green fibrous monolith composite body is formed of the multifilament extruded fiber.

Appln. No.: 10/005,656
Amendment dated January 9, 2004
Reply to Office Action of October 9, 2003

16. (Previously Presented) The process of claim 13 further comprising:

creating a drawing of desired composite object and separating the drawing into a plurality of segments utilizing a computer-aided design program;

generating input signals based on the drawing for directing the movable assembly in depositing the extruded filament onto the associated surface, wherein the movable assembly is controlled and guided in response to the signals.

17. (Previously Presented) The process of claim 13 further including subjecting the green fibrous monolith composite body to compression forces at a pressure, temperature and time effective for reducing porosity to provide a laminated green fibrous monolith composite body.

18. (Previously Presented) The process of claim 13 further including heating the composite body at a temperature and for a time effective for removing the thermoplastic polymer binder.

19. (Previously Presented) The process of claim 18 further including heating the green fibrous monolith composite body at a temperature and for a time effective for consolidating the green fibrous monolith composite body to provide a fully dense fibrous monolith composite object.

20. (Withdrawn) A composite object formed by the process of claim 13.

21. (New) The process of claim 13 further including forming the green filament by forming a feed rod from the first and second formable compositions, the feed rod including a central portion of the first formable composition and an outer portion of the second formable composition generally around the perimeter of the central portion and extruding the feed rod.